Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. “Thinking Through a Lesson Protocol: Successfully Implementing High-Level Tasks.”

*Mathematics Teaching in the Middle School 14* (October 2008): 132-138.

|  |  |
| --- | --- |
| **PART 1: SELECTING AND SETTING UP A MATHEMATICAL TASK (PREPARE)** | |
| What are your **mathematical goals** for the lesson? (i.e., what do you want  students to know and understand about mathematics as a result of this lesson?) | Build fractions from unit fractions of multiplication to multiply a fraction by a whole number.  Solve word problems involving multiplication of a fraction by a whole number. |
| * What are your **expectations** for students as they work on and complete this task? * What **resources or tools** will students have to use in their work that will give them entry into, and help them reason through, the task? * How will the students work—   independently, in small groups, or in pairs—to explore this task?   * How will students record and report their work? | Students are expected to participate in a task using appropriate voice levels and everyone will be accountable for the completion of the task.  Students will be given pencil, paper, and math journal.  Students will work in small groups or independently.  Students will record work in their math journals and share with the class on document camera. They will justify their answers. |
| How will you introduce students to the activity so as to provide access to *all*  students while maintaining the cognitive demands of the task? | **LAUNCH** Students will view a clip from the TLC show “Cake Boss.” <http://www.youtube.com/watch?v=ZVDEfbjia48> (start at 20 seconds to 1 minute.) I need to bake a cake for a wedding. The cake will have three tiers. Your job is to help me figure out how much of each ingredient I need for my cake. |

|  |  |
| --- | --- |
| **PART 2: SUPPORTING STUDENTS’ EXPLORATION OF THE TASK (EXPLORE)** | |
| As students work independently or in small groups, what **questions** will you ask to—   help a group get started or make progress on the task?   focus students’ thinking on the  key mathematical ideas in the task?   assess students’ understanding of  key mathematical ideas, problem- solving strategies, or the representations?   advance students’ understanding  of the mathematical ideas? | What information do you have?  How many servings are there total?  How many servings does the recipe make?  What is going to be your first step in solving this problem? |
| How will you ensure that students remain **engaged** in the task?   What assistance will you give or what questions will you ask a  student (or group) who becomes  quickly frustrated and requests more direction and guidance is  solving the task?   What will you do if a student (or group) finishes the task almost  immediately? How will you  extend the task so as to provide additional challenge? | Help them verbalize the process in solving the problem.  Reinforce the student’s ability to accomplish this task. “Use what you know how to do.”  Extensions:  What if the cake was 5 layers?  Design your own cake. |

|  |  |
| --- | --- |
| **PART 3: SHARING AND DISCUSSING THE TASK (DISCUSS/DEBRIEF)** | |
| How will you **orchestrate the class discussion** so that you accomplish your mathematical goals?   Which solution paths do you want to have shared during the  class discussion? In what order will the solutions be presented? Why?   What specific questions will you ask so that students will—  1. make sense of the  mathematical ideas that you want them to learn?  2. expand on, debate, and question the solutions being shared?  3. make connections among the different strategies that are presented?  4. look for patterns?  5. begin to form generalizations?  ***What will you see or hear that lets you know that all students in the class***  ***understand the mathematical ideas that***  ***you intended for them to learn?*** | Walk around and rank each group. Scaffold groups as needed.  Ask questions as needed. What do we know about fractions? What do we know about whole numbers?  What were the common findings within groups? How are they different?  Are there other ways to solve this problem that were not shared? |

**Cake Boss**

**I am baking a three tiered wedding cake. How much of each ingredient do I need to make the cake shown below?**

**Yummy Chocolate Cake (serves 6):**

**¾ cup flour**

**½ cup sugar**

Serves 6 people

**2 eggs**

**3/8 teaspoon baking soda**

Serves 12 people

**1/5 teaspoon salt**

**½ cup butter**

**2/3 cup buttermilk**

Serves 18 people

**4/8 cup oil**

**3/5 tablespoon cocoa**